

TORREYA

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A HISTORICAL SKETCH OF THE DEVELOPMENT OF BOTANY IN NEW YORK CITY.*

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It is my purpose this afternoon to direct your attention to the influences whose workings have brought into existence the present highly satisfactory organization of botanical work in this city. Among many minor elements, three stand out prominently, and call for our special attention. They are: (1) local botanical gardens, including the present one, and the persons who have been associated in their management; (2) the botanical department of Columbia College; (3) the Torrey Botanical Club.

Were we to commence with the very earliest botanical history of our city, we should be carried back to a time when, as an important seaport in a new world, it was made the temporary headquarters of visiting botanists, who accumulated here their collections, maintaining some of them in a living condition, until the arrival of a convenient opportunity for dispatching them to the mother countries. Such occurrences as these, exerting little influence in the permanent development of a botanical center here, occupy no place in to-day's consideration. Developmental work of the kind that concerns us was active, previous to the close of the 18th century, at some points farther south, especially at Philadelphia, and in New England, but not at New York.

The first important event here was the work of Doctor, afterward Governor, Cadwallader Colden and his daughter Jane, who, near the middle of the 18th century, conducted their studies with the aid of a small botanical garden at their home, near Newburgh.

* An address delivered before the Torrey Botanical Club at a special meeting held on May 23, 1906, in commemoration of the tenth anniversary of the commencement of work in the development of the New York Botanical Garden.

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Perhaps the most important part of this work consisted of the correspondence carried on with native and foreign botanists regarding their local flora, and the transmission of specimens. Miss Colden first made known our pretty little *Coptis*, or gold-thread.

A much more important event was the arrival here, in 1785, of the elder Michaux, who established a celebrated botanical garden at New Durham, N. J., the site of which is now occupied by the Hoboken cemetery. A brief account of this garden may be found in the *Bulletin* of our Club, **II**: 88. 1884. In that year I saw growing there a barberry bush which apparently represented the last trace of Michaux's plantings, except that the European medicinal shrub *Rhamnus Frangula*, which he appears to have introduced, has established itself in the adjacent lowlands, and at some neighboring points. Michaux's garden was established especially for the temporary cultivation of plants designed to be sent to France, or to yield seeds designed for such shipment. Nevertheless, so zealous an investigator as Michaux could not fail to utilize this agency for purposes of study, and his great work, *Flora Boreali-Americana*, published in 1803, and other works on North American botany, were thus materially enriched. Michaux's work in this country was continued by his son, one of whose important publications was a *Histoire des arbres forestiers de l'Amérique Septentrionale*, afterwards translated into English as *The North American Sylva*, and this also profited largely by the observations made by the father, while maintaining his garden.

During the time when the Michauxs were so active here, Mr. Samuel L. Mitchill was assiduously collecting plants in the vicinity of his home at Plandome, Long Island, a catalogue of which was published in 1807. His work is of special interest to us, since he was the first professor of botany in Columbia College.

The flora of Manhattan Island was at this time being very actively studied by Major John Le Conte, who in 1811 published an important catalogue relating thereto.

It is a well recognized historical fact that up to this time, and indeed for a long period following, botanical work proper in this country, consisted chiefly of the collecting and naming of plants, and the description of new species.

Writing of the period about 1814, made memorable by the publication of Pursh's *Flora Americae Septentrionalis* and Bigelow's *Florula Bostoniensis*, Darlington says "Botanical works now began to multiply, in the United States — and the students of 'the amiable science' found helps in their delightful pursuit, which rendered it vastly more easy and satisfactory than it had been to their predecessors."

The next botanical undertaking in this city was of the greatest importance in connection with our study, and calls for our particular attention. The successor of Dr. Mitchill as professor of botany and materia medica in Columbia College was Dr. David Hosack, a man of equal breadth and of great strength and energy. His interest in botany was chiefly medical. Most of the amateur botanists of that day were practising physicians, and many, if not most of the professionals had received a medical education and training, so that Dr. Hosack's attitude toward the science was not at the time peculiar. This fact reminds us that outside of the investigation of general and local floras, in their relations to geographical and taxonomic botany, interest then centered chiefly in the medicinal properties and uses of plants. A comparison between this branch of study as then understood and as now conducted can be briefly placed before you by stating that most of the plants then regarded as the important medicinal agents have been dismissed by modern medicine, except where it is trammelled by medical sectarianism. The explanation of their error is not that their results were reached empirically, for this is an excellent method, but that their empirical processes were full of natural sources of error, depending on impressions produced upon unqualified observers, among both patients and practitioners. The chemistry of plants was then practically unknown, whereas it is now the basis of medical botany. Since chemistry constitutes at the same time the visible basis of physiology, and physiology brings us as close as it is possible for us to get to the life of the plant, it follows that medical botany, while not entitled to the objective position that it held in the days of Hosack, is concerned with the same phenomena which engage the attention of the very highest workers in botanical science at the present day.

The great difference between the latter and the work as pursued by Hosack lies in our knowledge of the nature of the life processes and therefore of the proper and effective methods of studying them. Even in the state of ignorance which then existed, it was clear to such keen reasoners as Hosack that the reaching of sound botanical conclusions required that the living plant be kept under observation, and he became possessed of the strongest determination to establish a botanical garden adequate to the needs of local botanists and teachers of botany. After long efforts to secure sufficient coöperation, he at length decided to enter independently upon the enterprise, and in 1801 he purchased 20 acres of land at Elgin, now bounded by 46th and 50th Sts., and 5th and Madison Avenues (or probably of somewhat greater extent) and established the famous Elgin Botanical Garden, better known perhaps as the Hosack Botanical Garden. Besides his hardy plants, many were grown in a large conservatory. The site of this garden was described in 1811 as "about three and one-half miles from this city, on the middle road between Bloomingdale and Kingsbridge." This garden has of late years become so well known through various writings, that I shall not take up its general history. Hosack announced its primary object of attention as being the collection and cultivation of the native plants of this country, especially such as possessed medicinal value or were otherwise useful. He gratefully acknowledges assistance received in starting his Garden from Professor Mitchill, his predecessor, from the Hon. Robert R. Livingston and from John Stevens, Esq., of Hoboken. He soon learned what has recently become apparent to many persons here present, that the successful conduct of a botanical garden is a work of enormous labor and serious responsibility, and that one man, otherwise engaged, cannot accomplish it. With the garden already in actual successful operation, it was not so difficult to enlist state interest, and the legislature was induced to purchase it in 1810, and to provide the necessary funds by means of a lottery. Hosack subsequently enjoyed the classical distinction of all successful promotors of great enterprises, in being assailed by the high-class scum of citizenship. By subsequent legislative action the

property was turned over to Columbia College, and its use diverted from that of a botanical garden to that of highly profitable rentals.

We cannot understand the botany of Hosack's time without a brief glance at some of his contemporaries and immediate successors, especially those who exerted local influence. The list includes the names of some of the most honored of American botanists. Biographical sketches of all are to be found in our *Bulletin* file, so that I need not repeat the purely historical data, but may speak of the character of these men and of their work, in its relation to our subject. Foremost of them all was John Torrey, whose name is commemorated, I hope permanently, in that of our society. Following Dr. Hosack, he was the third of the five men who, up to the present, have occupied the chair of botany in Columbia College. His characteristics may be expressed in the terms, strong personal character, broad scholarship and great intellectual ability. Although best known to us as a botanist, yet thirty years of his life were those of a great teacher and worker in chemistry at the U. S. Military Academy at West Point, in the College of Physicians and Surgeons of this city, in Princeton College, and as U. S. Assayer in the New York office. Had the necessary facilities then existed in this country, it seems likely that this man, combining such a great knowledge of botany and chemistry, might here have developed important researches in the chemistry of plants. As a matter of fact, his knowledge of botany was acquired chiefly as a recreation in the hours of leisure afforded by his other professional work. Yet Underwood truly writes, "When the annals of American botany are finally written, no name will have a more conspicuous position than that of John Torrey."

Almost before reaching manhood Torrey was one of the founders of the New York Lyceum of Natural History, and was the leader in publishing, through it, a catalogue of plants growing within thirty miles of the city. Five years later he published the first part of his *Flora of the Northern and Middle Sections of the United States*, and later his *Compendium* on the same subject, important forerunners, in more than one way, of Gray's Manual.

These accomplishments proved him the great master that he was, and soon his hands were crowded with important work, especially connected with the active explorations of our western territory then in progress. In this work he was a close associate of Asa Gray, and probably their most important work was the first parts of their *Flora of North America*, published from 1838 to 1843. Many men whose work has thus branched out from local into general lines have allowed the latter to supplant and replace the former, but this was not true of Torrey, who combined in rare degree generic and specific powers. Not only were his interest and activity in local work undiminished, but they grew apace, and his patient and quiet enthusiasm gathered about him a group of associates who not only were devoted to him personally, but imitated and emulated his work. In this saying is stated the immediate origin of the Torrey Botanical Club. At various points in the history of our Club, we have been reminded that "a nation has arisen that knew not Joseph," and various proposals have been made for changing the name of the society. Let us record now the opinion that the selection of Torrey's name for this purpose was so just, natural and appropriate that its retention amounts to a historical necessity.

Except for the published works of Torrey, most of those of this early period which here concern us were of a somewhat general nature, but naturally including our local interests. Of these may be mentioned the following: In 1813, Muhlenberg's *Catalogue of North American Plants*, and in 1817 his work on North American grasses and sedges; in 1818, Nuttall's most scholarly work on the genera of North American plants; in 1820, Gray's *Genera*; in 1822, Schweinitz's *Monograph of the Genus Viola*; in 1833, Beck's *Botany of the Northern and Middle States*; in 1834, Schweinitz's work on North American Fungi, and in the same year, Gray's *Monograph of the North American Species of Rhynchospora*. In the meantime, very important works of a similar character were being produced in the South, and to a lesser extent, in the West.

These publications, it will be observed, were chiefly of interest to those actively engaged in original work, and not to young

students. In 1803 there appeared about the first work designed especially for the latter class, an elementary work on botany by Barton. Writing of 1824, Darlington says: "About this time some of the schools in the Northern States began to make a profession of teaching botany, and a demand for suitable books for this purpose arose. Accordingly, a number, such as they were, soon appeared. Among the most successful was a *Manual*, compiled by Professor Amos Eaton, of Troy, New York." Of the character of the educational works of the period, little need be said, since it is sufficiently indicated in that of the work in which botanists were then engaged. This sort of botanical teaching entered upon its most active stage with the appearance of Gray's *Elements of Botany*, in 1836, a work that is still being sold upon an extensive scale, and this, in your speaker's opinion, very greatly to the advantage of botany, in spite of the many books of different character, the use of which we so greatly enjoy. The publication, for the use of students, of text-books on structural botany, and later on morphology, in connection with manuals on local floras, became very popular, and of incalculable value in interesting people in the study of plants.

We must now pass from this general consideration of local botanical development up to the middle of the last century, and follow some special influences proceeding from the growth of the botanical department of Columbia College. During the period when Dr. Torrey was at its head, that department was very actively engaged in educational work, though this was of the peculiarly restricted sort characteristic of the times. About the time of his death in 1873, his herbarium and library, which he had previously maintained in his home, came into the possession of Columbia, together with the herbaria of Crooke, Chapman and Meissner. To these, collections from various parts of the world, and especially from those parts of the United States then being explored, were rapidly added, and a very large and important herbarium soon grew up; but no professor of botany was appointed to succeed Dr. Torrey, and the herbarium was neglected by the curator in charge. A very large part of it was not classified, nor even named, and lay in the form of a small mountain of dusty bundles

which were not, and could not be consulted. Botanical instruction was most meager, and was merely a part of the general course in biology. There was not, in fact, a department of botany, the subject being treated as a subordinate of geology, under Professor John S. Newberry. From 1875 to 1879, Dr. Britton was a student at the School of Mines, and was strongly attracted, by natural taste and ability, toward the botanical side of his work. When upon his graduation he was appointed assistant to Dr. Newberry, he appreciated clearly the great value of the materials for a botanical department, to be organized on a new and modern basis, which were in the possession of the College, and he began a careful and systematic examination of them. In speaking of this exceedingly important event in the general, as well as in the botanical, history of New York, your speaker takes the keenest delight, as he was for most of the time one of the closest associates of Dr. Britton, and can speak of that which he not only saw, but which he watched with appreciative interest.

A special stimulus to Dr. Britton at this time was his interest in his first great botanical undertaking, the preparation of an elaborate catalogue of the plants of New Jersey, this also, being performed subordinately to a department of geology. In this undertaking, an intimate association with the members of our Club and an active participation in its work were prime essentials to success, an illustration of the way in which existing forces worked together in carrying forward our natural botanical development. Another potent influence of a similar nature should be here recorded. At this time considerable botanical material from distant parts of this country and from other hitherto unexplored regions was coming to this city for original study, and this made it imperative that Columbia's botanical house should be set in order in the interest of comparative work. With the knowledge and encouragement of Dr. Newberry, but with comparatively little on the part of others concerned in the management of the college, Dr. Britton carried on this work in the interim of his official duties, until at length a great working herbarium existed where before there was chaos. At the same time the botanical instruction was being extended

and, of greater importance, was being modernized. When the Doctor was at length prepared to make the situation known to Columbia, it was not to submit plans for the organization of a botanical department, but to present to it one already made, and requiring only to be officially recognized and formally named. The performance of these ceremonies, with suitable provision for maintenance, guaranteed the position of New York as one of the first botanical centers of the country, and later of the world, with Dr. Britton as Columbia's fourth professor in this department. Thus we see that at every important stage in its development, the botanical department of Columbia has owed its prosperity not to the institution as such, but to some earnest worker, ready to make the sacrifice of love. Hosack individually made the botanical garden that afterward enriched the institution; Torrey accumulated the herbarium that became the corner-stone of the later structure; Britton silently — one may almost say surreptitiously — brought about changes which have finally placed it in the vanguard of the world's botanical forces.

The intercourse and personal and professional associations dependent upon the increasing number of persons in and about New York who became interested in botanical work in Torrey's time led most naturally and inevitably to a botanical society, at first incidental and unorganized, later a formal organization.

As is true of so many institutions which grow healthily and attain to great and permanent success, the exact date of the origin of our Club can hardly be fixed. Those of you who take even the slightest general interest in this subject should not fail to read * the inaugural address of Dr. George Thurber, delivered at the Astor House in 1873, on the occasion of his first election as our first president. He confesses his entire inability to fix on the time when Torrey and his friends virtually established the society. He says that for a long time after the election of the first set of officers the members found it impossible to break from the habit of informal, free-and-easy, conversational meetings which had grown up and which, I must remark, have always been found the most effective in the Club's work, whenever they have recurred.

* Bull. Torrey Club, 4: 26-39. 1873.

The Club's formal organization was undertaken in 1867, and its incorporation occurred four years later, under the name New York Botanical Club, changed the following year to that which it now bears. Within three years after its establishment the Club began issuing a monthly publication, the *Bulletin*, since uninterruptedly maintained. Its prefatory note declared its primary object to be "to form a medium of communication for all those interested in the Flora of this vicinity, and thus to bring together and fan into a flame the sparks of botanical enthusiasm, at present too much isolated. . . . We have chiefly in view the development of a greater botanical interest in our neighborhood, and found our hopes of success as much upon learners as upon the learned." May I pause here to ask all those present to regard this sentiment as that which actuates our Club to-day. There have been unfortunate periods in our history when this fundamental principle has been lost sight of; when learned newcomers, unfamiliar with our history and character, have assumed that we existed for the learned only. Believe me that this spirit does not exist to-day. We are most desirous that the knowledge should go abroad that the Torrey Botanical Club exists and is maintained for the most humble learners, equally with the learned, and our invitation to membership is to-day most cordially extended to everyone who desires either to assist in strengthening our influence, or to be assisted by us.

In the further unfolding of its objects, the *Bulletin* unconsciously states the object of the Club's organization: "An attentive study of plants in their native haunts is essential to the advance of the science, and in this respect the local observer has an advantage over the explorer of extensive regions, or the possessor of a general herbarium. He can note the plant from its cradle to its grave; can watch its struggles for existence, its habits, its migrations, its variations; can study its atmospheric and entomological economies; can speculate on its relations to the past, or experiment on its utility to man." Ecology is thus clearly seen to be the object of study, notwithstanding that the name of it was not generally discovered by our botanical fraternity until about 1890, nor the active and merciless chase of the poor

thing by American botanists well under way until about five years later.

From this time up to the establishment of the New York Botanical Garden the history of our Club is practically that of botany in this city, for very little was done that was not directly or indirectly connected with us or, one might say, actually centered about us. This fact is of the utmost importance in our study, since upon it depends the essential character of most of what has since occurred.

The Club's history is so voluminous that it requires separate and extended treatment, and I can here do little but refer to its influence. Its first officers were George Thurber, president; Timothy F. Allen, vice-president; A. A. Crooke, treasurer; James Hogg, corresponding secretary; P. V. LeRoy, recording secretary; William H. Leggett, editor; P. V. LeRoy, curator.

Some of the more influential of the early members call for attention at this point.

(To be continued in the July number.)

SOME MORE COASTAL PLAIN PLANTS IN THE PALAEOZOIC REGION OF ALABAMA

BY ROLAND M. HARPER

The unusual occurrence in the Cumberland plateau region of Alabama of quite a number of species of plants rarely met with outside of the coastal plain has been mentioned in the last few years by Kearney,* Mohr † and Harbison, ‡ but the subject is by no means yet exhausted, as recent investigations have shown.

In November last it was my privilege to spend two days in DeKalb County, one of the northeasternmost counties of Alabama, and even at that late season I was fortunate enough to find most of the coastal plain plants already reported from that region, as well as some interesting additions to the list. On the 24th I spent a few hours on Sand Mountain, near its southeastern edge,

* Science II. 12: 830-842. 1900.

† Contr. U. S. Nat. Herb. 6: 77-79. 1901.

‡ Biltmore Bot. Stud. 1: 154. 1902.